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the openings 36 and 42 can be simultaneously formed in one photoresist pattern, this photoresist pattern is used as a mask and the source region 38 and the drain region 44 can be simultaneously formed. In the second embodiment, if such a situation that the source region 38 largely creeps under the gate electrode 26 of the source region 38 can be ignored, the source region can be formed by the oblique ion implantation simultaneously with the drain region 44.

While the present invention has been described with reference to exemplary embodiments, it is to be understood that the invention is not limited to the disclosed exemplary embodiments. The scope of the following claims is to be accorded the broadest interpretation so as to encompass all such modifications and equivalent structures and functions.

This application claims the benefit of Japanese Patent Application No. 2015-031380, filed on Feb. 20, 2015, which is hereby incorporated by reference herein in its entirety.

What is claimed is:

1. A photoelectric conversion device comprising:
 - a pixel including a transfer transistor transferring signal charges generated in a photoelectric conversion portion from a charge accumulation region to a floating diffusion region; and
 - a peripheral transistor forming a peripheral circuit for controlling a read-out operation of a pixel signal based on the signal charges from the pixel,
 wherein a gate electrode of the transfer transistor and the floating diffusion region are separated from each other by a first distance in a plan view, and
 - a gate electrode and a drain region of the peripheral transistor are separated from each other by a second distance smaller than the first distance in a plan view.
2. The photoelectric conversion device according to claim 1, wherein
 - an impurity concentration of the floating diffusion region is not more than an impurity concentration of the drain region.
3. The photoelectric conversion device according to claim 1, wherein
 - the floating diffusion region includes a first diffusion region provided at a first depth and a second diffusion region provided at a second depth deeper than the first depth;
 - the gate electrode of the transfer transistor and the first diffusion region are separated from each other by the first distance in a plan view; and

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the gate electrode of the transfer transistor and the second diffusion region are separated from each other by a third distance smaller than the first distance in a plan view.

4. A method of manufacturing a photoelectric conversion device including a pixel including a transfer transistor transferring signal charges generated in a photoelectric conversion portion from a charge accumulation region to a floating diffusion region, and a peripheral transistor forming a peripheral circuit for controlling a read-out operation of a pixel signal based on the signal charges from the pixel, comprising:
 - forming a gate electrode of the transfer transistor and a gate electrode of the floating diffusion region over a semiconductor substrate;
 - forming the floating diffusion region in the semiconductor substrate so as to be separated from the gate electrode of the transfer transistor by a first distance in a plan view; and
 - forming a drain region of the peripheral transistor in the semiconductor substrate so as to be separated from the gate electrode of the peripheral transistor by a second distance smaller than the first distance in a plan view.
5. The method of manufacturing a photoelectric conversion device according to claim 4, wherein
 - in forming the floating diffusion region, the gate electrode of the transfer transistor and the floating diffusion region are separated from each other by the first distance in a plan view by performing ion implantation with providing an offset from the gate electrode by a mask.
6. The method of manufacturing a photoelectric conversion device according to claim 4, wherein
 - in forming the floating diffusion region, the gate electrode of the transfer transistor and the floating diffusion region are separated from each other by the first distance in a plan view by performing oblique ion implantation by using the gate electrode as a mask.
7. The method of manufacturing a photoelectric conversion device according to claim 4, wherein
 - forming the floating diffusion region includes
 - forming, at a first depth, a first diffusion region separated from the gate electrode of the transfer transistor by the first distance in a plan view; and
 - forming, at a second depth deeper than the first depth, a second diffusion region separated from the gate electrode of the transfer transistor by a third distance smaller than the first distance in a plan view.

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